

Healey and Cohen

FOREST HARVEST TRENDS ON FEDERAL LANDS PRECEDING AND FOLLOWING THE START OF THE NORTHWEST FOREST PLAN

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Assessment of harvest trends is an important part of the mission of the Northwest Forest Plan's (NWFP) Interagency Regional Monitoring Team. A traditional method for identifying regional harvest trends is through the re-measurement of forest inventory plots. However, plot-based methods do not provide the synoptic and spatially explicit harvest information needed to update maps of habitat and older forest; the only realistic source of such information is remote sensing. Stand-replacing harvests were mapped across the NWFP region using Landsat satellite data. Harvests in California between 1994 and 2003 were mapped by the California Land Cover Mapping and Monitoring Program (LCMMP), a partnership between Forest Service Region 5 and the California Department of Forest and Fire Protection. Harvests occurring in Oregon and Washington between 1972 and 2002 were mapped by the Laboratory for Applications of Remote Sensing in Ecology (LARSE) at the PNW Research Station in Corvallis.

Although there were significant methodological differences between the LCMMP (see Levien et al., 2003) and LARSE (see Cohen et al., 2002) change detection processes, both resulted in maps showing stand-replacing harvests and fires. Measured overall accuracies were relatively high. The maps showed that harvest patterns following the adoption of the NWFP have varied among physiographic provinces, administrative agencies, and land use allocations across the region. Mapped disturbances were used to identify post-NWFP changes to spotted owl (*Strix occidentalis caurina*) and marbled murrelet (*Brachyramphus marmoratus*) habitat and were also used to characterize changes in the distribution of older forests.

Substantial reduction of the annual harvest rate was observed on federal land in the mid- to late-1990's in Oregon and Washington (the California monitoring effort began with 1994). The harvest rate on private forestlands during this period was significantly higher than the federal harvest rate both in total acres and as a percentage of the land base. However, private harvest in the 1990's declined in relation to levels of the 1980's. A general monitoring strategy adopted by the NWFP has involved the production of baseline maps that are periodically updated with satellite-based change detection. This strategy is cost-effective in that the entire region does not have to be re-mapped to maintain current information. The work presented here demonstrates that relevant forest change information can be mapped with relatively high accuracy. Detection of more subtle, partial harvests is the subject of ongoing research, and it is likely that more detailed change information will be available in future monitoring efforts.

Cohen, W.B., Spies, T.A., Alig, R.J., Oetter, D.R., Maierberger, T.K., Fiorella, M. 2002. Characterizing 23 years (1972-1995) of stand replacement disturbance in western Oregon forests with Landsat imagery. *Ecosystems* 5: 122-137.

Levien, L., Fischer, C., Mahon, L., Parks, S., Maurizi, B., Longmire, P., Suero, J. 2003. Monitoring Land Cover Changes in California. California Land Cover Mapping and Monitoring Program, Cascade Northeast Project Area, Cycle II. USDA Forest Service and California Department of Forestry and Fire Protection Cooperative Monitoring Program. December 2003. 167p.

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